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BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

Status of the Mountain Pine Beetle Infestation in Ponderosa Pine Stands on the Bitterroot National Forest 1934

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Introduction

In accordance with the request of the Forest Service, an extensive survey was made of the east and west forks of the Bitterroot River and the Rye Creek, Little Sleeping Child and Sleeping Child watersheds, to determine the status of the Mountain pine beetle infestation in the ponderosa pine stands into which it had swept from adjoining lodgepole pine. Strips were run to secure data on current and prior losses from bark beetles for all timber types of which ponderosa pine is a part.

Status of the Infestation

In the succeeding paragraphs each area is discussed separately, giving the status and character of the infestation in the various hosts.

East Fork Bitterroot
Camp Creek and French Basin

	Attacked trees per acre 1934			Trees killed per acre Prior to '34	
	Mountain pine beetle in:		Western pine:		
	PP	LP	beetle in PP:	PP	LP
Camp Creek	.30	--	--	1.31	--
French Basin	.15	--	.10	17.33	.18

Data secured from this area have been tabulated separately for the Camp Creek and French Basin watersheds. The amount of the 1934 infestation is approximately the same in the two drainages, but losses prior to that year were more severe in French Basin. In neither drainage is there sufficient remaining infestation to cause much loss, and while losses in ponderosa pine stands have been high, there seems to be a much larger percentage of undamaged stand remaining than in the lodgepole pine stands.

A surprising feature of the data from the French Basin drainage is that the western pine beetle was responsible for more than 40 percent of the total number of ponderosa pine attacked. On none of the other drainages surveyed was there quite as large a proportion of trees infested by this insect. A second outstanding difference in strip data for the French Basin area was the large amount of timber killed per acre up to 1934, numbering more than 17 trees per acre. In spite of this heavy loss, there is still a fair stand of ponderosa pine on the area. A decided difference is noted in the susceptibility to mountain pine beetle attack between lodgepole pine and ponderosa pine of small diameter. The former species are comparatively immune to attacks when less than four inches in diameter, but the latter is attacked even as small as one inch and entire clumps covering as much as an acre have been killed. This type of destruction is common to all the areas surveyed.

A study of the tabulation indicates the infestation in ponderosa pine has now decreased until it is very light, apparently being dependent upon the lodgepole pine outbreak for insects and thus following the same trend. For this reason it seems likely that the outbreak in ponderosa pine will increase when it is decreasing in lodgepole pine due to shortage of host material.

East Fork Bitterroot
Rye Creek

	Attacked trees per acre 1934			Trees killed per acre prior to 1934	
	Mountain pine beetle in		Western pine beetle in PP		
	PP	LP		PP	LP
Rye Creek	.07	.008	.008	2.79	4.62

This area shows a much lighter infestation in ponderosa pine than was present in the French Basin and Camp Creek drainages. The number of trees killed per acre on this area has not been as high, but the writer believes their average diameter has been greater than those on the Camp Creek and French Basin drainages. Although no data are available for previous years, the writer believes from field observations that the outbreak is decreasing on this area.

Judging from the data secured, the amount of western pine beetle work on this drainage is quite light. However, it was noted that this insect usually attacks larger trees than those killed by the mountain pine beetle, a selection not confined to timber on Rye Creek but believed to be true for the entire area surveyed.

West Fork Bitterroot

Attacked trees per acre 1934			Trees killed per acre prior to 1934	
Mountain Pine beetle in		Western pine beetle in PP		
PP	LP		PP	LP
.22	.19	.02	3.25	11.27

This drainage showed the heaviest mountain pine beetle infestation of all those surveyed, but even so, it is quite light and judging from the red-top trees, it apparently is decreasing. Although examinations were of necessity confined to a very limited area, it is not believed that current losses were serious anywhere on this drainage.

The western pine beetle is showing some activity on this drainage, but the amount is slight. Also, there is some mountain pine beetle infestation in the lodgepole pine type, but, there too, the amount is slight and in its present status constitutes no serious threat as a source of supply to infest the remaining ponderosa pine stand.

Sleeping Child Creek Bitterroot

Attacked trees per acre 1934			Trees killed per acre prior to 1934	
Mountain pine beetle in		Western Pine beetle in PP		
PP	LP		PP	LP
.04	.04	.014	1.65	11.42

The lightest infestation of any of the areas surveyed is indicated by the data from this drainage, the combined activity of both

mountain pine beetle and western pine beetle resulting in only slightly over .05 attacked trees per acre. However, the data secured showed the lightest stand of ponderosa pine per acre of the entire area surveyed. Where infestation is present, the proportion of the total ponderosa pine killed is high, but even then it averages only slightly more than .35 trees per acre, a very light infestation. In lodgepole pine the infestation is quite light, although losses prior to 1934 have been very heavy in that timber type, averaging nearly 11.5 trees per acre.

None of the areas surveyed showed an existing infestation which is of a serious nature or which gives any indication of future increases in severity. Not only is the infestation light in ponderosa pine, but in adjoining lodgepole pine stands only one area showed a heavier infestation in lodgepole than in ponderosa pine. It is believed that mountain pine beetle outbreaks in ponderosa pine are usually "overflows" from adjoining or nearby lodgepole pine stands. With infestation very light in both timber types, it seems unlikely that losses from the mountain pine beetle will be appreciable during the next few years.

In discussing the losses which have occurred over the areas surveyed, it was interesting to note that a fairly large proportion of the original ponderosa pine stand remains. The living timber is not confined to the smaller diameter classes as in lodgepole pine

but includes many large trees. Similar to conditions in lodgepole pine stands subsequent to an outbreak are the scattered groups of ponderosa pine which have escaped with little or no damage.

Western pine beetle activity is responsible for about 15 percent of the total loss in 1934. Some loss from this insect may be expected every year as ponderosa pine is its specific host, but for the mountain pine beetle ponderosa pine is but an occasional host. For this reason it is believed the western pine beetle activity, though it may fluctuate considerably, will continue indefinitely while the mountain pine beetle may practically disappear from the stand.

In an effort to secure some index of the effect of stand composition on attacks by the mountain pine beetle, the entire strip data were divided into the various timber types. Only 10.4 percent of the stand was found to be pure ponderosa pine, 46.3 a ponderosa pine-Douglas fir mixture, 1.7 percent a ponderosa-lodgepole pine mixture and 14.3 percent contained ponderosa pine, lodgepole pine and Douglas fir. The remaining 27.3 percent contained no ponderosa pine or was untimbered. A short tabulation below gives the number of new attacks and red-topped ponderosa pine per acre.

Status of the Mountain Pine Beetle Infestation
In Stands Containing Ponderosa Pine
1934

Stand Composition	M.A per acre	Red-topped ponderosa pine per acre	Acres of strip	Percent of total strip
PP	.029	1.39	85.3	10.4
PP-DF	.540	.02	379.7	46.3
PP-LP	.014	.25	13.5	1.7
PP-LP-DF	.021	.31	117.0	14.3

Lacking data on the original stand per acre for the various timber types, it is impossible to give the percentage of susceptible timber killed by the mountain pine beetle. There appears to be no correlation, however, between stand composition and losses , either for 1934 or prior to that time. It is quite possible that the data secured are insufficient and that an analysis of more data would indicate a definite trend.

Respectfully submitted,

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